

**Notice of Allowability**

Application No.

09/877,585

Examiner

Kiran B. Patel

Applicant(s)

BASFORD, WILLIAM COLIN

Art Unit

3612

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/10/05.
2. ☒ The allowed claim(s) is/are 26-31, 33 and 35.
3. ☒ The drawings filed on 10 May 2005 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance             |
|   | 9. <input type="checkbox"/> Other _____   |

**Examiner's Amendment and**  
**Examiner's Statement of Reasons for Allowance**  
**Allowance**

1. An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this Examiner's amendment was given in a telephone interview with Mr. Jones on 5/10/05.

2. The application has been amended as follows:

Cancel claims 1-25, 32, 34.

Fig 8 has been amended as per the attached proposed Fig 8, which will be further amended to incorporate reference number for limitations of claim 33.

Following is a complete list of all the, as amended, pending claims in this Application replacing all previous revisions.

1-25 Cancel.

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26. An apparatus for reducing the fluid-dynamic base drag of a bluff body (20) moving through a fluid (21) and creating, at the rear of the body, a low pressure wake having an outer wake perimeter, which bluff body (20) has a substantially flat rear base surface (25), a pair of opposed side surfaces (22A and 22B), and opposed top and bottom surfaces all joined with said rear base surface at side, top and bottom trailing edges (24), respectively, so as to form a box container (30), said apparatus comprising:

V shaped vortex generators in a linear array (40) ahead of the trailing edges (24) of said bluff body (20) for generating counter rotating stream-wise vortices (27) in a fluid boundary layer (23) passing generally along said bluff body and creating from said layer separated shear surfaces (26) which turn sharply inward aft of said trailing edges (24);

boattail plates (50) inset and affixed a distance (18) from the top and side trailing edges(24); and

rear edges on said boattail plates (50) sized to intercept the separated shear surfaces (26) at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body.

27. The apparatus in accordance with claim 26 wherein the bluff body is a land vehicle.

28. The apparatus of claim 27 wherein the vortex generators are positioned with an open end facing toward a forward end of said vehicle; and the pointed end pointed toward the rear of said vehicle.

29. The apparatus of claim 27 wherein said land vehicle includes a truck body with a rear opening, and further comprising:

boattail plate hinging means allowing said plates to swing clear from said rear opening.

30. The apparatus of claim 27 wherein said truck body has a pair of swinging rear doors (36) vertically divided lengthwise top to bottom at about the center of the base surface, said apparatus further comprising:

means dividing the top boattail plate at the point of division of the doors such that opening of the doors allows said boattail plates to separate and travel away with the swinging doors.

31. The apparatus of claim 28, wherein said inset distance is about 8 to 9 percent of the lesser of the height or width of said rear base surface.

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32. Cancel.

33. The apparatus of claim 26 wherein the height of said vortex generators is in the range of  $1/4$  to  $1/5$  of the thickness of said local boundary layer.

34. Cancel.

35. Apparatus for reducing to a minimum the fluid-dynamic base drag of a bluff body moving through a fluid passing generally along said bluff body and creating, at the rear of the body, separated shear surfaces which define a low pressure wake having an outer wake perimeter, which bluff body has a substantially flat rear base surface with given height and width dimensions and a periphery of trailing edges, said apparatus comprising:

vortex generator means mounted adjacent to and forward of said periphery for generating counter-rotating stream-wise vortices in said fluid layer, which generators cause the separated shear surfaces to turned sharply inward thereby reducing the size of the low pressure wake; and


edge means coupled to said base surface and inset from said trailing edges for intercepting said separated shear surfaces at the outer perimeter of said low pressure wake, namely, at a distance behind said base surface of about  $1/6$ th to  $1/8$ th of said given height or width dimension, whichever is less.

3. The following is an Examiner's statement of reasons for allowance:

The primary reason for the allowance of the claims in this case, is the inclusion of the limitation "boattail plates inset and affixed a distance from the top and side trailing edges and rear edges on said boattail plates sized to intercept the separated shear surfaces at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body" in the independent claim, in combination with the other recited limitations in claims supported by this application, which are not found in the prior art of record.

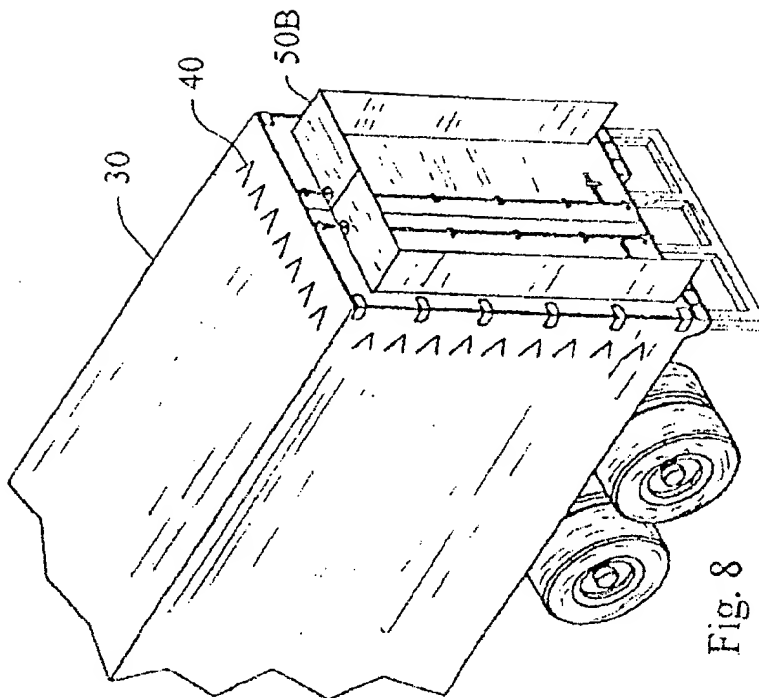
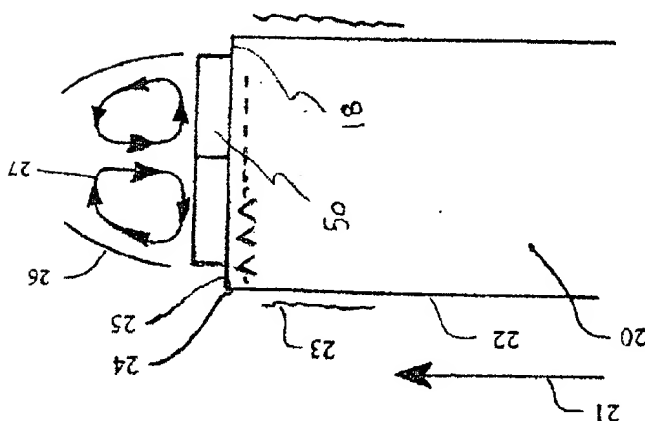
4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications should be directed to Primary Examiner Kiran B. Patel whose telephone number is 571-272-6665. The examiner can normally be reached on M-F from 8:00 to 5:00. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

  
Kiran B. Patel, P. E.  
Primary Examiner  
Art Unit 3612  
May 10, 2005

In re Application of:  
Basford, William C.  
Filing Date: June 8, 2001  
Serial No.: 09/877,585  
For:

**APPARATUS TO REDUCE BASE DRAG  
BEHIND BLUFF BODIES (as amended)**


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